

Ex Parte

July 22, 2013

Marlene H. Dortch  
Secretary  
Federal Communications Commission  
445 12<sup>th</sup> Street, SW  
Washington, DC 20554

**RE: Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, GN Docket No. 12-268**

**RE: In the Matter of Promoting Interoperability in the 700 MHz Commercial Spectrum, WT Docket No. 12-69**

Dear Ms. Dortch:

On Thursday, July 18, 2013, James Warden, Paul Frew, David Steer, and Müge Ayşe (Aya) Kiy of BlackBerry Corporation met with David Goldman and Alex Hoehn-Saric of Commissioner Rosenworcel's office. In addition, on July 19, 2013, the same BlackBerry representatives and Chris Parandian of Tin Can Communications met with Courtney Reinhard of Commissioner Pai's office. The discussion in these meetings focused on the topics set forth in the attached slide presentation.

During the meetings, we discussed the practicalities around the technical implementation of the proposed band plans. Consistent with our comments and our response to the Commission's May 17<sup>th</sup> Public Notice, we reiterated our support for the Commission's "Down from 51" approach and our concerns about the number of sub-bands in the plan.

We also discussed the technical constraints presented by antenna design and filter requirements, including size and performance constraints. BlackBerry emphasized that it is important for the Commission to recognize the limitations of technology in designing a path forward to achieving our shared objectives of maximizing spectrum, increasing flexibility, and creating an environment that supports ubiquitous and sustainable mobile handsets. As well, we repeated our support for an internationally harmonized band as the best way to achieve a competitive and healthy handset ecosystem.

Finally, in our meeting with David Goldman and Alex Hoehn-Saric, we discussed the inevitable tradeoffs between the objectives the Commission has set forth in its 700 MHz proceeding. We expressed that, to the extent possible, the Commission should consider addressing the technical challenges manufacturers face in developing handsets for the 700 MHz band such as the high power broadcasts in Channel 51. Such a holistic approach that includes a long term plan to align bands and their technical characteristics will maximize the opportunity for interoperability.

Sincerely,



Müge Ayşe (Aya) Kiy

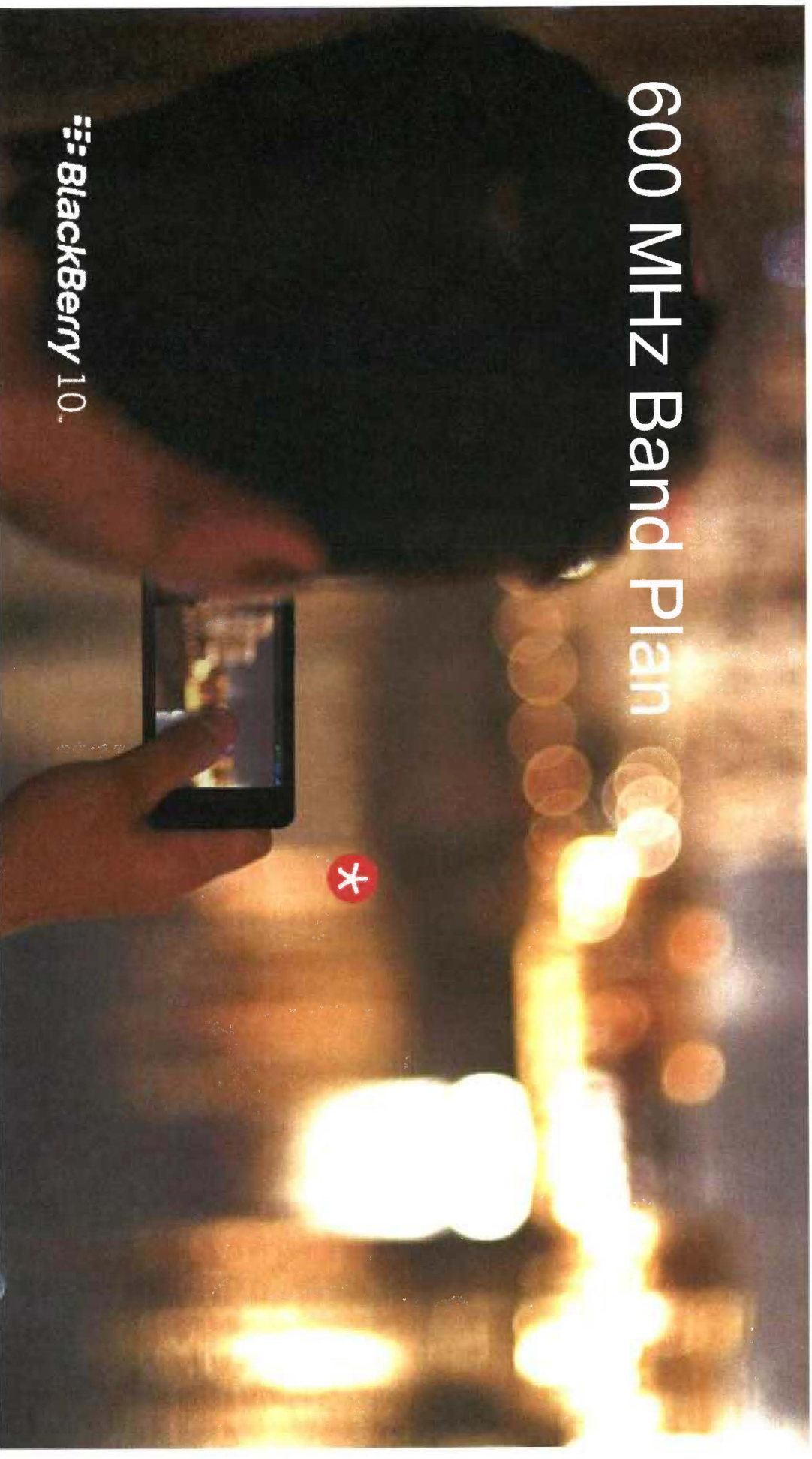


Attachment

cc: David Goldman  
Alex Hoehn-Saric  
Courtney Reinhard

# 600 MHz Band Plan

 BlackBerry 10.



# Contents

- A band plan for 600 MHz
- Antenna design
- Filter requirements
- Harmonization

BlackBerry® Z10 smartphone





# A Realizable Band Plan for 600 MHz

Balance among practical technical limitations

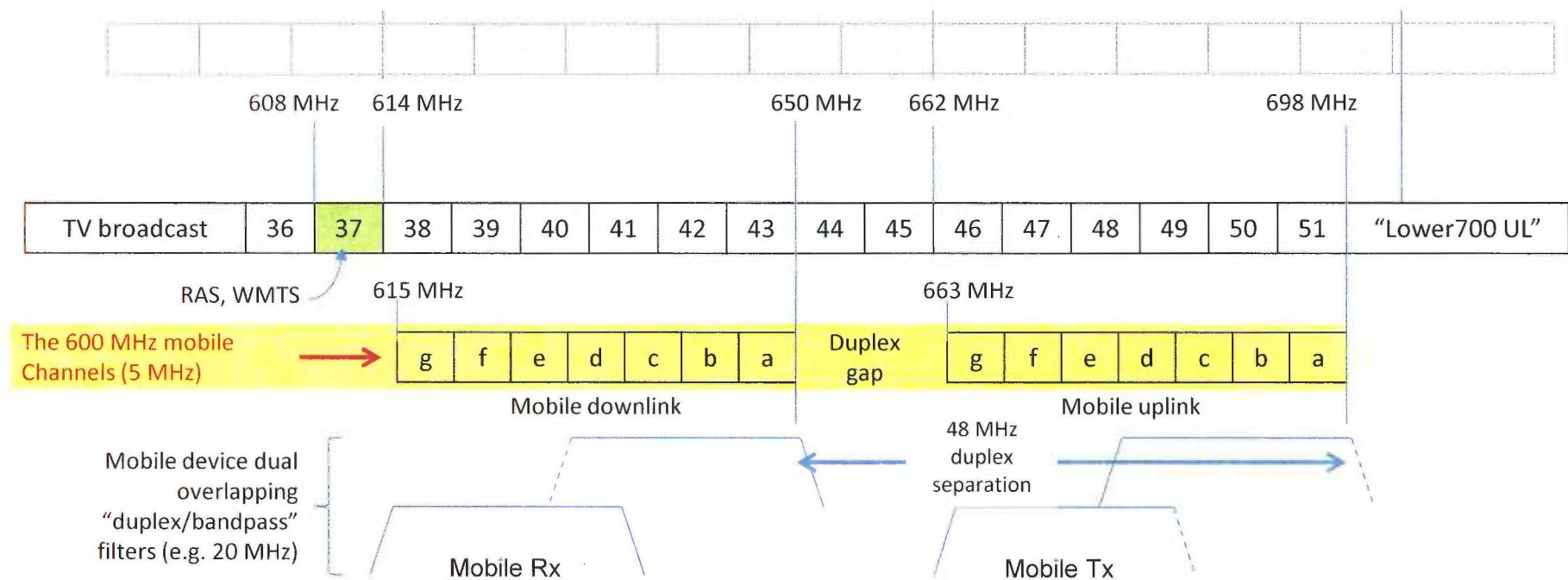
**Alignment** uplink and downlink aligned with adjacent services  
→ minimize “guard bands” & interference

**Antenna** ~10% bandwidth  
614-698 is 13% (84/656) → developing technology dynamic antenna tuning  
efficiency → low efficiency - significant loss

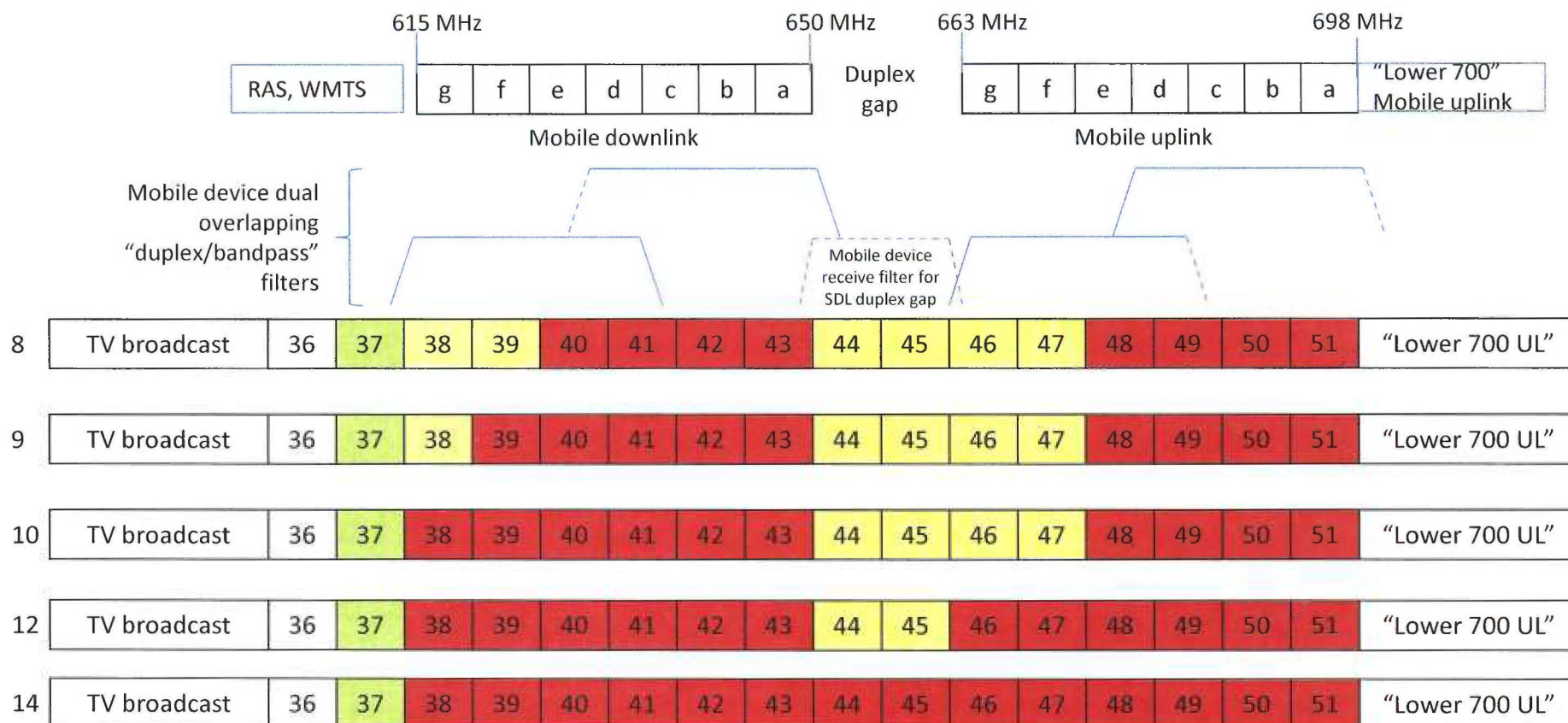
**Filters** ~4% bandwidth (25/656)  
space for only one set (large chip at 600 MHz band)  
dual overlapping duplex filters  
→ developing technology for APT 700 MHz band plan

**Signal strength** compatibility  
mobile services need signals in range ~ -90 to -25 dBm  
repacking to match coverage areas  
→ enable some plan flexibility

# A Realizable Band Plan for 600 MHz



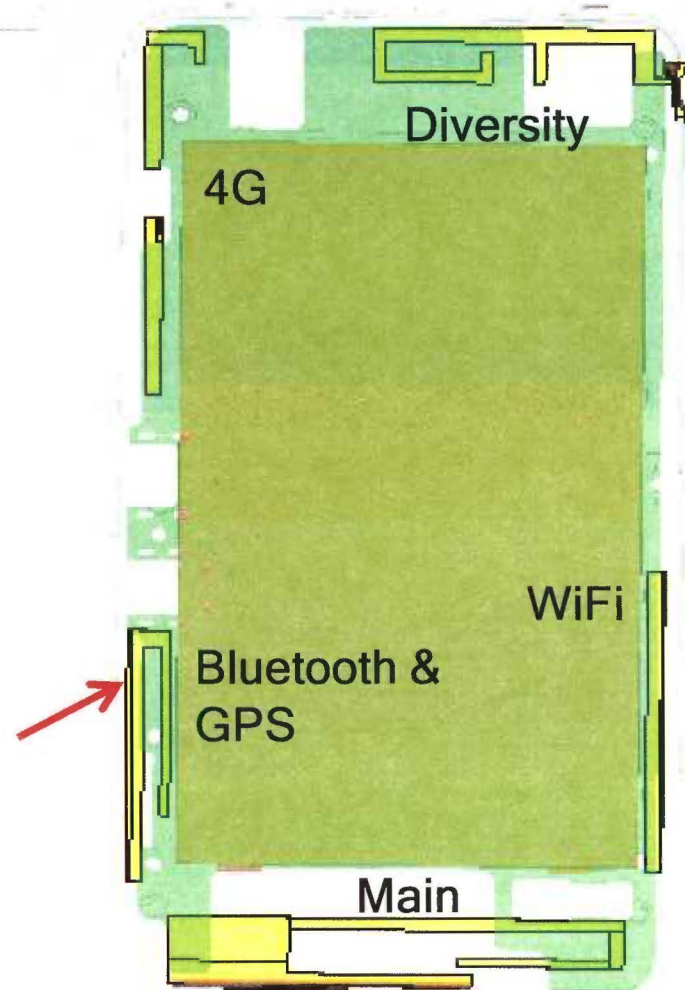
# A Realizable Band Plan for 600 MHz



# Antenna Design

Size constraints  
Bandwidth  
Efficiency  
Number of antennas  
Regulatory requirements

There are many  
antennas in the  
devices already





# Band-Pass Filters / Duplexers

The 600 MHz frequencies add challenges to filters and duplexers

- Size constraints of components

- Performance

- Band-pass filters

- bandwidth

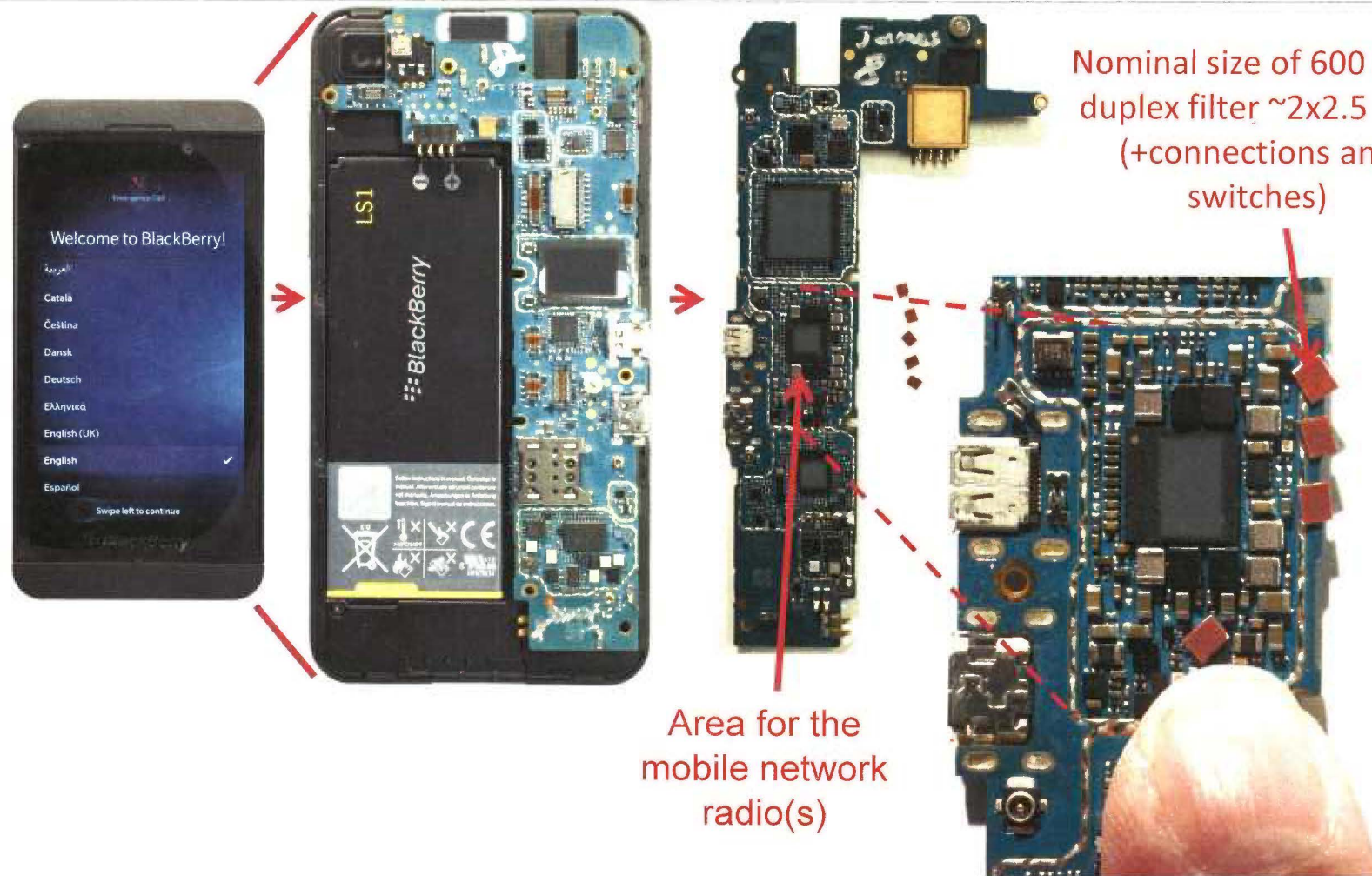
- Duplexers

- gap size

Number of filters/duplexers for fully flexible handset

BlackBerry® Q10 smartphone





# Handset Constraints

It's not just the 600 MHz band

## Mobile Network bands

Quad band LTE 2, 5, 4, 13, 17 \*\* (700/850/1700/1900 MHz)  
 Quad band HSPA+ 1, 2, 4, 5/6 \* (850/1700/1900/2100 MHz)  
 Quad band EDGE (850/900/1800/1900 MHz)

\*Note: HSPA+ Band 4 (AWS) is carrier dependent

\*\*Note: LTE Band 13/17 is carrier dependent

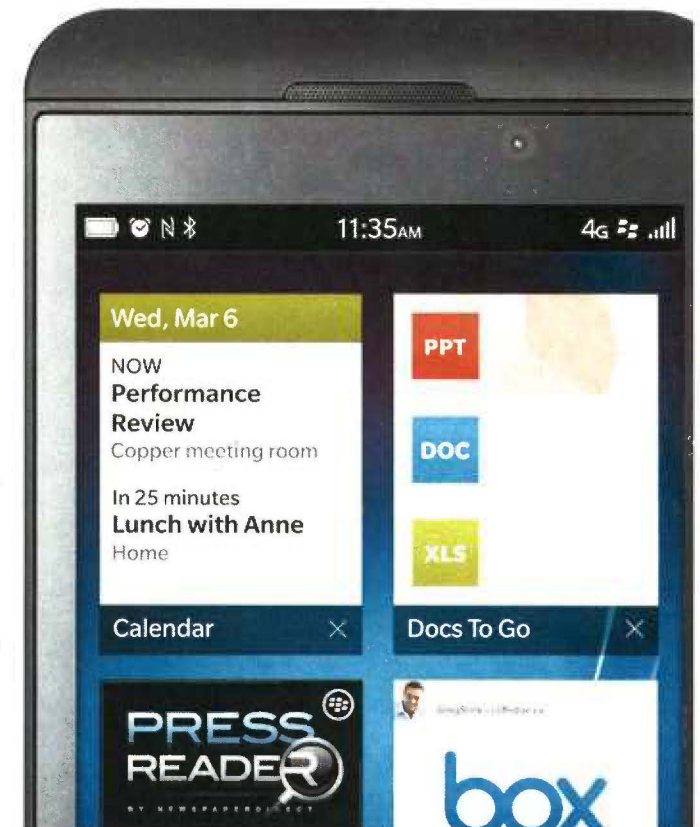
**Wi-Fi®** (2.4 GHz / 5 GHz)  
 802.11 a/b/g/n

**Bluetooth®** (2.4 GHz)  
 Bluetooth 4.0 Low Energy (LE)

**GPS** (1.57542 , 1.2276 GHz, 1.598-1.605 GHz)  
 Assisted, Autonomous and Simultaneous GPS  
 GLONASS Support

**NFC** (13.56 MHz)  
 communication between NFC-enabled devices

BlackBerry® Z10 smartphone





# Harmonization

700 MHz serves as an example

Best opportunity to support competition and healthy handset ecosystem

Critical if more bands are to be accommodated

7 IMT bands have over 30 band plans today



# Q & A